

REMARKS

Applicants respectfully request reconsideration and allowance of the above-identified patent application. By this amendment, claims 1, 2-19, 21-29, and 31 remain pending, wherein claims 1, 2-19, 21-23, and 29 have been amended, and claims 2, 20, 30, and 32 have been canceled.¹ Of the pending claims, the independent claims include the computer program product of claim 1, the method of claim 23, and the computing system of claim 29.

In the Office action, claims 1-32 are rejected under 35 U.S.C. § 101 as allegedly being directed toward non-statutory subject matter. Based on the foregoing, Applicants respectfully request withdrawal of these grounds of rejection.

First, the Office action indicates with respect to claims 1, 23, 29, and 32 that the claim language simply represents an abstract idea and fails to provide a useful, concrete, and tangible purpose or result. In order to address the Examiner's concerns, Applicant has amended the independent claims to more positively recite the limitation of "*generating a report of the integrity of a live volume, which indicates to a user that one or more errors were found and that the live volume should be taken off-line in order to fix the one or more errors.*" (Emphasis added). Since these claims have been amended to substantially conform to those suggestions provided by the Examiner, Applicants respectfully submit that the claims do indeed provide a useful, concrete, and tangible result, as required by the Interim Guidelines issued by the U.S.P.T.O. Accordingly, Applicants respectfully request withdrawal of this ground of rejection.

Next, the Office action alleges that in view of Applicants' disclosure the computer-readable media is not limited to tangible embodiments, instead being defined as including both tangible embodiments (e.g., storage media) and intangible embodiments (e.g., a communication media, which includes wireless communications, RF, Infrared, acoustic, etc.). In the interest of expediting prosecution of the current application, Applicants have amended the claims to substantially conform to suggestions from the Examiner.² Accordingly, Applicants respectfully request withdrawal of this ground of rejection.

¹ Support for the claim amendments can be found throughout the specification; for example, support may be found in the following: pg. 2, ll. 9-18, pg. 3, ll. 5-16, pg. 18, ll. 11-21, pg. 19, ll. 14-17, pg. 21, l. 19 through pg. 20, l. 4, and pg. 23, ll. 1-7.

² Nevertheless, Applicants reserve the right to further challenge this ground of rejection by way of presenting corresponding claims that define the computer readable medium in terms consistent with the breadth of that term as provided in Applicants' specification in any related application, as deemed appropriate by Applicants.

Next, the Office action rejects claims 5 under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. More specifically, as the Examiner properly notes, claim 5 was inadvertently listed as depending on itself. Accordingly, claim 5 has been amended to now depend on claim 4 in order to address the Examiner's concerns. Accordingly, Applicants respectfully request withdrawal of this ground of rejection.

Further, the Office action rejects the independent claims under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 6,014,669 to Slaughter et al. ("*Slaughter*"). The remaining dependent claims are rejected under either 35 U.S.C. § 102(e) as allegedly being anticipated by *Slaughter* or under 35 U.S.C. § 103(a) as allegedly being unpatentable over *Slaughter* in view of U.S. Patent No. 6,981,114 to Wu et al. ("*Wu*") and/or further in view of U.S. Patent No. 6,377,958 to Orcutt ("*Orcutt*").³ Applicants respectfully traverse these grounds of rejection.

Applicants' invention generally relates to storage verification. Historically, if a system administrator wanted to verify the integrity of a volume, they would have to bring the volume off-line. Bringing a volume off-line; however, has the undesirable effect of making the volume unavailable during an integrity check. Accordingly, read-only integrity checks were developed

Applicants respectfully submit that there is sound policy reasons why a signal, carrier wave or "connection" used to provide software to users should be treated no differently for purposes of patent eligibility than a computer disc such a CDROM or floppy disk. On a strictly factual basis it is highly questionable whether a signal, carrier wave or other connection is not "tangible". Simply because one cannot see or touch the medium does not change the reality that such a medium nonetheless is real and is used every day to transmit and download software just as effectively as software contained on a CDROM. Thus, to deny patent eligibility for such claims is to ignore the reality that such media is most certainly employed in the using and selling of software carried by such a medium, and thus denies claims to a patent owner that would otherwise provide a basis for asserting direct infringement against competitors, thereby relegating such subject matter to assertions of indirect infringement only, with no sound policy basis for doing so. In other words, to deny such computer program products of patent protection on this basis appears to be exalting form over substance.

Moreover, the asserted reason for treating so-called "signal" claims differently from other kinds of computer readable media (e.g., that wireless signals or connections are not tangible, and cannot tangibly embody a computer program or process since a computer cannot understand/realize (i.e. execute) the computer program or process when embodied or carried on the data signal or connection) is equally as true for other media such as discs or CDROMs. Executable instructions on a disk or CDROM, like those carried by a signal or connection, also cannot be understood or executed until those computer-executable instructions are off-loaded from the disk or CDROM into the computer's RAM. This is no different for a carrier signal or connection, and hence the asserted factual distinction as to tangibility simply lacks merit.

³ Although the prior art status of the cited art is not being challenged at this time, Applicants reserve the right to challenge the prior art status of the cited art at any appropriate time, should it arise. Accordingly, any arguments and amendments made herein should not be construed as acquiescing to any prior art status of the cited art.

to allow on a live volume diagnostics. Although such checks allow for on-line analysis of a volume, the system must still be brought off-line to execute any type of volume-fixing utility when errors are identified. Because of the changing nature of files and meta-data in a live volume, diagnostics generated by the read-only mechanism often produce false errors, thereby inappropriately causing the administrator to take the system offline or ignore future true errors reported by the diagnostic program.

In order to overcome the deficiencies and drawbacks of current read-only integrity checks of a live volume, embodiments provide for creating a shadow copy of the live volume, which can then be used to perform the diagnostic analysis. The shadow copy provides a logical duplication of the live volume at a point in time, which can then be examined for errors. A report can then be generated, wherein if errors are found, the administrator can take the volume off-line to run the appropriate fixing utility. Note that because a shadow copy is used for the integrity verification, it is not subject to change, but users can still access the live volume during the integrity check.

Claim 1 is directed toward some of the embodiments identified above and recites a computer program product configured to implement a method of ensuring against false error reporting during an online verification process by finding errors in a shadow copy of the live volume. The computer program product configured to first receive a request to run a verification tool on a live volume in order to determine if errors exist thereon. Based on the received request, shadow copy of the live volume can be created, which provides a logical duplicate of the live volume at a point in time. The shadow copy is then examined to verify integrity of the live volume, wherein the shadow copy does not change during examination, but users still have access to the live volume during the integrity verification. Based on the examination of the shadow copy, a report on the integrity of the live volume is generated, which indicates to a user that error(s) were found and that the live volume should be take off-line in order to fix the error(s). Claims 23 and 29 recite a method and computer system with elements similar to those described above with regards to claim 1.

Applicants respectfully submit that the cited art fails to anticipate or make obvious the claimed invention. In particular, the cited alleged prior art does not disclose, suggest, or enable

each and every element of Applicants' claimed invention.⁴ For example, *Slaughter*, *Wu*, and/or *Orcutt*—taken either individually, or as a whole—do not disclose or suggest receiving a request to run a verification tool on a live volume; based on the received request, creating a shadow copy of the live volume, which provides a logical duplicate of the live volume at a point in time; examining the shadow copy to verify integrity of the live volume, wherein the shadow copy does not change during examination, but users still have access to the live volume during the integrity verification; and based on the examination of the shadow copy, generating a report on the integrity of the live volume, which indicates to a user that error(s) were found and that the live volume should be take off-line in order to fix the error(s), as recited, *inter alia*, in claims 1, 23, and 29.

Slaughter discloses a distributed cluster configuration database. As such, *Slaughter* is primarily concerned with maintaining consistent data among nodes, which are devices configured to perform an operation upon operand(s) to produce a result. To insure the integrity of the cluster (i.e., two or more nodes), certain information, such as configuration files, must be maintained consistently among the nodes of the cluster. In order to maintain consistent data among nodes, *Slaughter* provides a two-level consistency framework, which first checks local consistency and then checks global consistency. Local consistency of a configuration database is determined using a "consistency record"; while global (i.e., cluster wide) uses a two-phase commit protocol to guarantee the consistency of the configuration database after a configuration database update.

Although *Slaughter* discloses storing shadow copies of the configuration database at each node in case of an update failure during the global consistency check, *Slaughter* does not

⁴ "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." MPEP § 2131. That is, "for anticipation under 35 U.S.C. 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly." MPEP § 706.02. Applicants also note that "[i]n determining that quantum of prior art disclosure which is necessary to declare an applicant's invention 'not novel' or 'anticipated' within section 102, the stated test is whether a reference contains an 'enabling disclosure.'" MPEP § 2121.01. In other words, a cited reference must be enabled with respect to each claim limitation.

In order to establish a *prima facie* case of obviousness, "the prior art reference (or references when combined) must teach or suggest all the claim limitations." MPEP § 2143 (emphasis added). In addition, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. MPEP § 2143. During examination, the pending claims are given their broadest reasonable interpretation, i.e., they are interpreted as broadly as their terms reasonably allow, consistent with the specification. MPEP §§ 2111 & 2111.01. Finally, Applicants note that MPEP §2141.02 states that the cited references must be considered as a whole, including those sections that "teach away" from the claimed invention. (Citation omitted).

disclose or suggest examination of the shadow copy to verify integrity of the live volume. In fact, *Slaughter* simply uses the shadow copy to roll back the configuration database to a previous state when an update transaction was unsuccessful—i.e., during the global consistency check. (See e.g., col. 5, ll. 30-39). Nevertheless, it appears that the Office action also relies on the use of the “consistency record” during the local consistency check as allegedly disclosing the examination of the shadow copy of a volume as currently claimed. Applicants respectfully note, however, that the “consistency record” cannot possibly be considered a shadow copy as currently claimed. More specifically, col. 10, l. 64 through col. 11, l. 12 of *Slaughter* makes clear that the consistency record uses a “checksum” and length of the configuration database for validating the local configuration database copy. Such checksum (which typically consists of a hash value of static data for consistency determinations), however, cannot possibly be considered a shadow copy of a live volume as currently claimed, which provides a logical duplicate of the live volume at a point in time.

Nevertheless, even if such checksum could be considered a shadow copy of a live volume, *Slaughter* does not disclose or suggest the generation of reports of the integrity of the volume, which indicates to a user that error(s) were found and that the live volume should be take off-line in order to fix the error(s). Instead *Slaughter* simply uses the local validation for determining which copies of the cluster configuration database on each node are valid, and which of the valid copies is the most up-to-date for replicating the most up-to-date copy on each node. Accordingly, Applicants respectfully submit that *Slaughter* does not disclose or suggest receiving a request to run a verification tool on a live volume; based on the received request, creating a shadow copy of the live volume, which provides a logical duplicate of the live volume at a point in time; examining the shadow copy to verify integrity of the live volume, wherein the shadow copy does not change during examination, but users still have access to the live volume during the integrity verification; and based on the examination of the shadow copy, generating a report on the integrity of the live volume, which indicates to a user that error(s) were found and that the live volume should be take off-line in order to fix the error(s), as recited, *inter alia*, in claims 1, 23, and 29.

Noting some of the deficiencies of *Slaughter*, the Office action cites both *Wu* and *Orcutt*. *Wu* discloses a snapshot reconstruction from an existing snapshot and modification logs; while *Orcutt* discloses a file system conversion mechanism. As note above, the Office action relies on

these references as allegedly disclosing various elements within Applicants' dependent claims. As such, neither *Wu* nor *Orcutt* can rectify those deficiencies noted above with regards to *Slaughter*. As such, Applicants respectfully submit that the combination of *Slaughter*, *Wu*, and/or *Orcutt*—taken either individually—does not disclose, suggest, or enable each and every element of Applicants' claims 1, 23, and 29.

Based on at least the foregoing reasons, Applicants respectfully submit that the cited prior art fails to anticipate or make obvious Applicants' invention, as claimed for example, in independent claims 1, 23, and 29. Applicants note for the record that the remarks above render the remaining rejections of record for the independent and dependent claims moot, and thus addressing individual rejections or assertion with respect to the teachings of the cited art is unnecessary at the present time, but may be undertaken in the future if necessary or desirable, and Applicants reserve the right to do so.

All objections and rejections having been addressed, Applicants respectfully submit that the present application is in condition for allowance, and notice to this effect is earnestly solicited. Should any question arise in connection with this application or should the Examiner believe that a telephone conference with the undersigned would be helpful in resolving any remaining issues pertaining to this application, the undersigned respectfully requests that he be contacted at +1.801.533.9800.

Dated this 16th day of February, 2007.

Respectfully submitted,

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